

TRANSPORT SCOTLAND TRUNK ROAD INSPECTION MANUAL



Contents

Section	Page
1 Introduction	1
2 IRIS	3
3 Survey Procedure	5
4 Inspections and Patrols	9
5 Categories of Defects	12
6 Inspection Requirements	14
Bituminous Carriageways	15
Concrete Carriageways	19
Pedestrian and Cycle Facilities	23
Covers, Gratings and Frames	31
Kerbs, Channels, Edgings and Quadrants	34
Linear Drainage Systems	37
Gullies, Catchpits, Soakaways, Manholes, Interceptors and Separators	40
Drainage Grips	43
Ditches 45	
Filter Material	47
Drainage Structures	49
Balancing Ponds	51
Drainage Ancillary Items	53
Communications and Miscellaneous Equipment	54
Geotechnical Assets	57
Grass, Bulbs and Wildflower Areas	59
Woodland Areas and Trees, Scrub Areas, Shrub Areas and Hedges	63
Wetland Areas	66
Special Ecological Measures	68
Road Restraint Systems – Vehicle and Pedestrian	74
Fences, Walls, Screens and Noise Barriers	78
Road Markings	81
Road Studs	85
Road Traffic Signs & Road Lighting	88
Traffic Signals	93

Roadside Electrical Apparatus, Road Lighting and Power Supplies	97
Cable Chambers	98
Electrical Ducting and Cables	99
Ancillary Drainage Items (Powered)	101
Cabinets and Electrical Pillars	103
Bollards	105
Lighting Point	107
Festive Lighting	110
Structures	113
Roadside Services	115
Sea and Air Navigation Lights	117
Traffic Control Barriers	119
Traffic Signs	121
Weather Stations	123
Wildlife Counters	126
Navigation Aids	128
Arrester Beds	130
Snow Poles	131
Traffic Control Barriers	132
Litter and Refuse	133
Dead Animals	136
Removal of Graffiti	139
Node Markers	140
Network Referencing	141
Flooding	142
Forth Road Bridge	143
Appendix A – Acronyms and Supporting Documents	144
Appendix B – Pavement Surface Identification	145
Appendix C – Traffic Sign Guidance	148
Appendix D – XSP Examples	152
Appendix E – Electrical Safety at Site	155
Appendix F – Inspection Timetable	156

1 Introduction

1.1 Document Control

This is Version 1 (Amendment 4) issued August 2014 of Transport Scotland's Trunk Road Inspection Manual. The version control table identifies the current Version Number of the Manual, the date it was last modified, as well as information on previous versions.

Note. This manual is a working document and will be updated on an ad-hoc basis to reflect changes to the network, amend existing assets, or to encompass additional assets where required.

Version No.	Date	Comment	Initials
0.7	07/12/10 - 04/03/13	Working Draft Documents	Redacted 11/2
1	15/04/13	First Issue	
Version 1 (Amendment 1)	18/12/13	Electrical CAT1 defects added reflecting contractual requirements.	
	28/2/14	DDA defects distributed across other inventory items	
	28/2/14	Revised c/way CAT1 definition	
Version 1 (Amendment 2)	10/4/14	Update terminology to reflect IRIS modules and remove reference to 4G, replace with neutral OC contract references.	
Version 1 (Amendment 3)	24/4/14	DDA defects distributed to other appropriate inventory & inspections activities to match existing DDA defects.	
	1/5/14	Forth Road Bridge CAT 1 defects added	
	1/5/14	Added allowable inventory items to Snow poles inspection to reflect Contract requirements	
Version 1 (Amendment 4)	25/8/14	Revised c/way CAT1 definition	
Version 1 (Amendment 5)	15/02/2019	Change Balancing Pond Inspection Frequency to "At intervals not exceeding 12 months"	
		Change Culvert Inspection Frequency to "At intervals not exceeding 12 months"	
		Change All Ancillary Drainage Inspection Frequencies to "At intervals not exceeding 12 months"	

1.2 Enquiries

This manual is controlled by the Trunk Roads and Bus Operations Directorate, and any queries regarding this manual should be directed to:

Transport Scotland
 Trunk Roads and Bus Operations Directorate
 Asset Management Branch
 Buchanan House, 58 Port Dundas Road, Glasgow

1.3 Objectives and Scope

Detailed Inspections of assets are required to be carried out in accordance with Schedule 7 Part 1 of Transport Scotland Operating Company Contract and this *Transport Scotland Trunk Road Inspection Manual*. Operating Companies are required to log all Category 1 and Category 2 Defects into the Routine Maintenance Management function (RMMf), prioritise, prepare and submit programmes and bids for the repair of Category 2 Defects. This will produce short to medium term work programmes.

Objective: The Transport Scotland Trunk Road Inspection Manual sets out the procedures for undertaking detailed inspections as well as providing details on inspection frequencies, guidance on defects which should be entered into the Routine Maintenance Management function (RMMf) database and lists of defect codes. Where appropriate, photographs have been included to assist in the identification of defects

This Manual covers areas of activity in which work is generally short term and necessary to keep the road network in good working order. It does not deal with the replacement or renewal of those parts of the road which, over a longer term, become unserviceable because of general wear and tear which would properly be dealt with by planned programmes of structural maintenance work. The inspection procedures however do assist in identifying the need for replacement or renewal under such programmes.

1.4 Contents

The contents of this Trunk Road Inspection Manual are as follows:

- Section 2 – provides a brief outline of Integrated Road Information System (IRIS) and the Routine Maintenance Management function (RMMf).
- Section 3 – describes the network referencing and survey procedures required for the operation of RMMf.
- Section 4 – sets out the inspections and patrols undertaken by the Operating Company in order to identify defects and provide a long-term condition rating for each asset.
- Section 5 – defines Category 1 and Category 2 defects and associated response times.
- Section 6 – sets out the specific inspection requirements for each asset type.

2 IRIS

2.1 General

IRIS (Integrated Road Information System) is Transport Scotland's primary road asset management system and is comprised of a number of interrelated components including the Pavement Management System (PMS) and the Routine Maintenance Management System (RMMf). The IRIS applications provide the following business capabilities:

- Improved data management by holding network, construction, definitive inventory, traffic, accident and condition data on a single database.
- Enhanced analysis and reporting of the data both in map-based and textual formats.
- Integrated tools for the optimisation, in terms of minimising whole life cost within the available budget, of pavement maintenance at both a scheme and network level.

This manual describes the survey and inspection regimes, and associated data items, that are reviewed and populated in IRIS. The terminology and data fields described in this manual align with those used in IRIS.



2.2 Routine Management Maintenance System

The RMMf implements management procedures for the routine maintenance of the trunk road network. It enables all inspection and other reports, complaints and third party claims to be assessed in conjunction with the inventory, previous maintenance actions and other relevant data.

Inspections are carried out with hand-held data capture devices (DCD's), using standard data capture programs that include check-lists setting out the various defects to be noted. The check lists are programmed such that:

- only the permitted inventory codes can be used with the relevant Detailed Inspection codes for each infrastructure item, and
- inventory codes can only be used if the inventory item exists in the individual section.

The data is uploaded into the RMMf when the inspection has been completed. Information from all inspections and surveys, together with any immediate or programmed action is recorded consistently,

analysed and reviewed in conjunction with other relevant survey information to enable a holistic view to be taken of maintenance condition and trends related to network characteristics and use. Records of assessments, planned actions and actions taken are used for benchmarking and efficiency.

Management procedures ensure that records are retained in an appropriate archive for the necessary period, such that they remain secure, accessible and retrievable. The RMMf forms part of the quality management system and is used for analysis of the records collected and the production of summaries of the information at appropriate levels of detail. Statistical, logistical and financial analyses of the records enable the performance of engineering assets to be assessed over a prolonged period of time.

3 Survey Procedure

3.1 Section Referencing

Section Referencing provides a consistent and robust location referencing system, enabling the accurate and reliable allocation of data to the trunk road network for which Transport Scotland is responsible.

Transport Scotland's trunk road network is defined such that a unique identifier can be given to any location on the network. The RMMF requires the road network to be divided into **Links** which are further divided into **Sections**. The combination of the Link Code and the Section Number is referred to as the Section Identifier, or Section ID. A **node** is specified at each end of the Section and is used to identify a fixed point on the road surface. The location across the road is specified by the use of **Cross Sectional Position** (XSP) codes.

Section Referencing Principles

The Scottish trunk road network is defined by a linear network referencing system. This system is used to divide each route on the network into distinct lengths of Links and Sections. Each Link and Section has attributes defining its location, road characteristics and shape, where:

- Links - form the primary division of the trunk road network and are generally assigned to lengths of road between major junctions; and
- Sections - are subdivisions of links and are defined between easily identifiable features such as minor junctions, major structures, change of surface, change of speed restriction, and change in the number of permanent lanes, roundabouts, slip road entry and slip road off.

Section Reference Markers

The start and end points of Links and Sections are marked by sets of studs, or nodes. Each node represents a fixed definable point on the road surface to which chainage can be related. Nodes also assist with the correlation of the data with other network systems such as the Scottish Roads Traffic Database (SRTDb).

A Link node is indicated by three marker studs while a Section node is indicated by two marker studs:

- Indicates the start of a new Link (assigned a five-digit number, i.e. **99999/xx**)
- Indicates the start of a new Section (assigned a two-digit number i.e. **xxxx/99**)

The definitive trunk road network (nodes, links and sections) is held in IRIS. This provides the reference basis for all inventory and inspection surveys. Where there are considered to be anomalies in the IRIS network it should be discussed with Transport Scotland (where appropriate, following the procedure set down in contractual documents).

Node markers on the trunk road network must be accurately located and visible at all times. All other new, missing or defective node marker installations are treated as Category 1 Defects and must be replaced by the Operating Company in accordance with contractual requirements.

Once the network has been defined in terms of Links and Sections, inventory and inspection surveys can be undertaken. There are a number of rules and conditions which are applied when conducting surveys, as follows:

Direction of Survey

In the RMMF database the start and end nodes define the direction of survey. The following conventions are used:

- On single carriageway roads the normal survey direction is that of increasing section numbers, e.g. 10403/05, 10403/06, 10403/07 etc.
- For dual carriageways the start and end of a section is specified in the direction of traffic flow.
- Inventory items lying outside the node positions are recorded at the chainage of the node, for example at approaches to roundabouts.

The inspection team are informed of the survey direction indicated by the RMMF database before starting its measurements. Surveys in the reverse direction are supported by the system and are used, for example, for safety reasons. If a section is surveyed in the reverse direction the XSP's must be entered facing towards the position at which the survey was started, i.e. look backwards.

Nominated Section

An item or defect which occurs in the central reserve of a dual carriageway or motorway and is common to both carriageways is only recorded once. Examples include double sided guardrail, double bracket lamp column and bridges. To facilitate this requirement one direction of the carriageway is referred to as the '**nominated section**'.

The nominated section of a dual carriageway or motorway is pre- determined and will generally be in a set direction for each route e.g. Northbound or Westbound etc. the nominated direction is contained within the section information of the RMMF database and should be ascertained before starting any survey.

Measurement of Chainage

In general all chainage measurements are made along the left-hand edge of the carriageway or hardshoulder on motorways from start node to end node in the direction specified above.

A large roundabout (but not a mini-roundabout) is designated as a separate section and its start/end point is identical. Measurements of chainage are made around the outside of the roundabout in the direction of the traffic flow.

3.2 Cross-Sectional Position (XSP)

Each IRIS Section represents a strip of road that includes both the carriageway and off-carriageway features (e.g. footways and verges) up to the trunk road boundary. As such, the section can be considered to consist of a number of identifiable longitudinal strips that correspond to features such as lanes, kerbs and line markings that indicate the edge of the carriageway etc. These longitudinal strips and lines are referred to as Cross Section Positions (XSPs). It should be noted that each strip does not have to have a constant width.

The XSPs that may be used within IRIS are shown in Table 1 with the numbering and position of the XSPs across the road.

Table 1 – Cross Sectional Positions

Name of XSP	Abbreviation	Strip or Line	Number Convention
Left Boundary	LB	Line	
Left Boundary Area	LA	Strip	
Left Off Carriageway	L	Strip	1 to 4, right to Left
Left Edge	LE	Line	
Left Hard Shoulder	LH	Strip	
Left Additional Nearside Lane	-L	Strip	1 to 2, Right to Left
Left Permanent Lane	CL	Strip	1 to 3, Left to Right
Left Additional Offside Lane	+L	Strip	1 to 2, Left to Right
Centre Line	CC	Line	
Right Additional Offside Lane	+R	Strip	1 to 2, Right to Left
Right Permanent Lane	CR	Strip	1 to 3, Right to Left
Right Additional Nearside Lane	-R	Strip	1 to 2, Left to Right
Right Hard Shoulder	RH	Strip	
Right Edge	RE	Line	
Right Off Carriageway	R	Strip	1 to 4. Left to Right
Right Boundary Area	RA	Strip	
Right Boundary	RB	Line	

Note that the XSP conventions assume that two sides of a motorway or dual carriageway are modelled independently.

3.3 Item Type

The position of an inventory item within a section is recorded by chainage and cross-sectional position. Inventory items are categorised as 'point', 'continuous' or polygon (area) items.

- Point items - occur at a specific location along a section and have a short length in the chainage direction, i.e. the start chainage is almost the same as the end chainage. A point item is located by its (i) section identifier; (ii) cross-sectional position (XSP); and (iii) chainage, where the chainage is measured from the start of the section. Examples of point items include bollard, lighting point and gully.
- Continuous (running) items - items that have sufficient length to merit the recording of a start and end chainage. A continuous item is located by its (i) section identifier; (ii) start and end chainage, where the chainage is measured from the start of the section; and (iii) cross-sectional position (except where the cross-sectional position is not required, e.g. carriageway and bridges). Examples of continuous items include central reserve, cycle facility and verge.
- Polygon (area) items - items that have a significant area but an irregular shape. A polygon is located by its (i) section identifier; (ii) start and end chainage, where the chainage is measured from the start of the section; (iii) cross-sectional position; (iv) sequence of straight line segments defining the boundary of the polygon. Examples of polygon items are embankments, cuttings and woodlands.

Intermediate Entry

Continuous items may change characteristics along their length, for example, carriageway width changes or surface material changes. At these change points an entry is required in the RMMfto capture the details of the change; this is called an 'intermediate entry'. The inspector may record the termination of the preceding part of the event and start a new entry but depending upon the DCD software, it may be more efficient to record the new input details at the change point using the 'intermediate' feature.

3.4 Surveyors Notebook Facility

The notebook facility is provided to enable the inspector to record notes directly on the DCD. It is used for recording any special notes, over and above that required by the item attributes, that the inspector may consider would be useful and of assistance in the checking and editing of the survey data.

4 Inspections and Patrols

4.1 General

The Operating Company is required to carry out Safety Inspections, Safety Patrols, night time Safety Patrols, Detailed Inspections and Condition Inspections. All information is recorded in the Routine Maintenance Management function (RMMf) in a systematic format via electronic data capture devices (DCD's), using inspection codes and defect codes.

4.2 Safety Inspections

Safety inspections are designed to identify those defects which are likely to constitute a danger to the public, road users, maintenance personnel, livestock or property and therefore require immediate or urgent attention (*Category 1 defects*).

Safety Inspections are carried out at frequencies not exceeding seven days on all Trunk Roads including slip roads in accordance with the requirements of Schedule 7 Part 1 of Transport Scotland Operating Company Contract. Where possible, Safety Inspections are carried out during off-peak traffic periods in order to minimise traffic disruption.

Each year at least two Safety Inspections are carried out either during, or immediately following, a period of wet weather to identify areas prone to flooding. There is a minimum period of three months between wet weather Safety Inspections.

Safety Inspections inspect all that can be seen from a slow moving vehicle within the boundary of the Trunk Road (however, where a defect is observed that may be a danger to the public, road users, maintenance personnel, livestock or property it may be necessary to investigate further on foot). The Operating Company includes documented procedures in its Management System for determining the appropriate inspection speeds for Safety Inspections. It may be necessary to undertake some safety inspections on foot, especially on footways, or where electrically energised apparatus is present.

Safety Inspections are recorded against the network referencing and includes the date and time each link and section was completed. All Safety Inspection data, including inspection route and Defect data, is uploaded into the Routine Maintenance and Management system within 24 hours of the Safety Inspection commencing.

It shall be noted that where the item of equipment is electrically energised or contains electrically energised parts the inspection of that item is required to conform to the inspection and testing requirements of BS7671.

4.3 Safety Patrols

Safety Patrols are designed to supplement Safety Inspections by providing a structured, more frequent surveillance of the Trunk Road Network to identify Category 1 defects.

Safety Patrols are carried out on the Trunk Roads described in Schedule 7 Part 1 of the Transport Scotland Operating Company Contract. Safety Patrols are carried out such that a Safety Inspection or Safety Patrol is carried out at intervals not exceeding four days.

Where possible, Safety Patrols are carried out during off-peak traffic periods in order to minimise traffic disruption. The Operating Company includes documented procedures in its Management System for determining the appropriate inspection speeds for Safety Patrols.

Safety Patrols are recorded against the network referencing and includes the date and time each link and section was completed. All Safety Patrol data, including inspection route and Defect data, is uploaded into the Routine Maintenance Management system within 24 hours of the Safety Patrol commencing.

4.4 Night Time Safety Patrols

Night time Safety Patrols of illuminated signs, illuminated bollards and lighting points (including but not limited to road lighting, flood lighting, underpass lighting, architectural lighting, navigational lighting, pedestrian lighting, bus shelter lighting and festive lighting) is carried out in accordance with the requirements of the Design Manual for Roads and Bridges except that they are carried out at intervals not exceeding 14 days from 1 October to 31 March and at intervals not exceeding 28 days from 1 April to 30 September. In addition to recording defects observed in apparatus which are the responsibility of a 3rd party the Operating Company shall report such defects to that party.

4.5 Detailed Inspections

Detailed Inspections are generally walking inspections designed to establish programmes of routine maintenance tasks which do not require urgent execution (*Category 2 defects*).

The Operating Company is required to carry out Detailed Inspections in accordance with the requirements of Schedule 7 Part 1 of the Transport Scotland Operating Company Contract and Chapter 6 of this *Trunk Road Inspection Manual*. The Operating Company is required to ensure that the inspection intervals referred to in this Trunk Road Inspection Manual are not exceeded.

Unless stated otherwise within Chapter 6 of this Manual, Detailed Inspections are generally undertaken at intervals not exceeding 12 months and are normally carried out from the footway, hardshoulder or grass verge on the nearside lane. Where inventory items are within or adjacent to a central reserve on a motorway or dual carriageway, an additional Detailed Inspection of such items is undertaken every 24 months from the offside lane.

Detailed Inspections are arranged to minimise disruption to traffic, other road users and the public, while ensuring adequate access to allow proper inspection and provide a safe working environment for the inspection personnel involved.

Whenever practicable, Detailed Inspections which necessitate Lane Occupations are carried out in conjunction with other Operations. Where separate Lane Occupations are necessary, Detailed Inspections are undertaken in off-peak traffic conditions. The Operating Company plans its schedule of Detailed Inspections requiring a Lane Occupation to ensure that as far as is practical, all Detailed Inspections are carried out and completed during that Lane Occupation.

Detailed Inspections are recorded against the network referencing. All Detailed Inspection data, including inspection route, Defect data, and all associated data shall be uploaded into the RMMF within four days of the completion of each network referencing section or inventory item.

The Operating Company validates the accuracy of inventory during Detailed Inspections. Any errors are recorded as a Defect and corrected within four days. Such errors are also processed and corrected in accordance with the documented procedures in the Operating Company's Management System.

4.6 Landscape Opportunity Inspections

The Operating Company's Landscape Architect is required to prepare and maintain a schedule of landscape opportunities for use in the preparation of a Landscape Development Plan. The schedule of landscape opportunities is informed by the results of the regular landscape opportunities inspections and by ad-hoc inspections and visits to the network by the Landscape Architect.

The landscape opportunities inspections are undertaken by the Landscape Architect. These inspections are undertaken regularly at intervals not exceeding 12 months to identify potential opportunities to improve the landscape associated with the trunk road network.

4.7 Condition Inspections

Effective asset management planning requires the adoption of a long term strategic assessment through the development of lifecycle plans. This is difficult to achieve using short and medium-term programmes derived from Category 2 Defects identified from Detailed Inspections. A consequence of this is that there may be no information recorded about the condition and, hence, the change in condition of some aspects of the network.

To overcome this lack of information, the Detailed Inspection requirements for some asset types include a regular assessment and reporting of condition. These assessments are referred to as *Condition Inspections* and involve recording the state of the asset in accordance with the *Transport Scotland Condition Manual*. The main objective of collating condition data is to provide accurate lifecycle information, and not to supersede the contractual requirements covering the way the Operating Companies manage defects arising from the Detailed and Safety inspections.

The condition inspections are primarily designed to:

- Feed key performance indicators with respect to safety, serviceability and sustainability (to be reported in Transport Scotland's Road Asset Management Plan);
- Compare the performance of ancillary assets across the trunk road network;
- Provide information on deterioration curves to support long-term financial planning.

5 Categories of Defects

5.1 General

When a defect has been identified, the Operating Company is required to use the guidance outlined in this Trunk Road Inspection Manual and take account of applicable regulations and engineering judgement in deciding when remedial action will be necessary and to make recommendations on the type of work required. There are two categories of defect defined in this Trunk Road Inspection Manual, namely Category 1 and Category 2.

5.2 Classification of Category 1 Defects

Category 1 Defects require prompt attention because they represent an immediate or imminent risk of either one or more of the following:

- Injury to any party using or repairing the trunk road network
- Significant disruption to the normal flow of traffic through the trunk road network
- Significant deterioration of any specific part or infrastructure of the trunk road network
- Damage to a third party's property, livestock or equipment
- Damage to the environment
- Liable to leave Scottish Ministers in breach of one or more of their statutory duties
- Failure to effectively enforce the legality of an asset that has a mandatory or prohibitory function
- Failure of an asset to fulfil its intended function where such an asset protects the road user, maintenance personnel, environment, the trunk road network infrastructure, and/or facilitates the safe use of the trunk road network
- Offence to road users from graffiti that is obscene, blasphemous or otherwise offensive.

Examples of the types of defects that may constitute a Category 1 Defect are given for each asset type in the appropriate sections of Chapter 6. However, this Trunk Road Inspection Manual is deemed not to contain an exhaustive compendium of defects and in the absence of a description of a defect, the Operating Company is required to make the classification from first principles.

The principles of a system of defect risk assessment for application to safety inspections is set out in Chapter 9 of *Well Maintained Highways – Code of Practice for Highway Maintenance*. Each Operating Company should provide clear guidance and training to employees in the conduct of safety inspections.

5.3 Response to Category 1 Defects

Category 1 Defects are corrected or made safe in accordance with Schedule 7 Part 1 of the Transport Scotland Operating Company Contract.

Category 1 Defects are corrected or made safe at the time of inspection if reasonably practicable. In this context, making safe may constitute displaying warning notices/signs, coning off or fencing to protect the public from the defect. If it is not possible to correct or make safe the defect at the time of inspection, repairs of a temporary or permanent nature are carried out as soon as possible and no later than:

- 06:00 on the day following identification of the Category 1 Defect on carriageways,
- within 24 hours of identification for all other Category 1 Defects.

Where a temporary repair has been carried out, the deferred permanent repair period for the following defect types shall be

- 28 days for carriageway surface,
- 56 days for bridge parapets,
- All other Category 1 Defects repaired permanently within the specific period referred to in Schedule 7 Part 1 of the Transport Scotland Operating Company Contract, or no later than 28 days after identification where no specific period is stated.

5.4 Classification of Category 2 Defects

General

Category 2 Defects are those which, following a risk assessment, are deemed not to represent an immediate or imminent hazard or risk of short term structural deterioration. Category 2 Defects should be repaired within planned programmes of work. The Operating Company logs, groups together and prioritises the repair of Category 2 Defects and submits programmes and bids for repairs in accordance with the requirements of Schedule 4 Part 1 of the Transport Scotland Operating Company Contract.

Disability Discrimination Act

In December 2006, a new duty took effect, requiring government departments and agencies to publish a Disability Equality Scheme outlining how they would implement Disability Discrimination Act (DDA) 2005 responsibilities through policy, guidance, planning and stewardship. As trunk road authority, Transport Scotland published the trunk road Disability Equality Scheme and Action Plan document 'Roads for All' in December 2006 (<http://www.transportscotland.gov.uk/road/maintenance-and-management/accessibility>).

The document focuses on the design, construction, operation and maintenance of the trunk road network and forms part of the wider Disability Equality Scheme for Transport Scotland and the Scottish Government. The Action Plan included a requirement to inspect the whole trunk road network, including bus stops, to identify the extent of all types of barrier to travel for all users of the trunk road network.

Transport Scotland is committed to developing a programme to address the removal of these barriers to accessibility on the trunk road network. This will be achieved via a combination of taking opportunities to address these barriers where possible in conjunction with operations and works contracts, and also through future stand-alone works.

6 Inspection Requirements

6.1 General

This Trunk Road Inspection Manual is intended to be of loose leaf construction to facilitate updates as required, and contains details of the inspection activities for each asset type, each in its own section and sub-divided as follows:

- A list of detailed inspection codes relating to an activity and a schedule of the inventory items to which they apply.
- A schedule of defect codes specific to the activity, the defect attribute, unit of measurement, and minimum and maximum values.
- Notes on specific individual defects (where applicable).
- An indicative list of Category 1 Defects requiring immediate action.
- A list of DDA Defects (where applicable).
- Where deemed appropriate, relevant photographs are also included.

The detailed inspection requirements for each asset type are outlined in the following sections. A summary of inspection frequencies is also provided in Appendix F.

Examples of the types of defects that may constitute a Category 1 Defect are given for each asset type in the appropriate sections of Chapter 6. However, this Trunk Road Inspection Manual is deemed not to contain an exhaustive compendium of defects and in the absence of a description of a defect, the Operating Company is required to make the classification from first principles.

The principles of a system of defect risk assessment for application to safety inspections is set out in Chapter 9 of *Well Maintained Highways – Code of Practice for Highway Maintenance*. Each Operating Company should provide clear guidance and training to employees in the conduct of safety inspections.



Bituminous Carriageways

Permitted Inventory Items

- Carriageway (CW)
- Crossovers (XO)
- Central Reserves (CR)
- Central Islands (CI)
- Hard Shoulders (HS)
- Lay-by (LB)

This section relates to minor repairs to bituminous carriageways. It does not relate to larger scale work needed to strengthen the carriageway or to work linked with structural maintenance, including surface dressing, which would normally be classed as, or linked to, structural maintenance activities.

Particular consideration should be given to defects, which may constitute an immediate danger to road users and to identify deficiencies compromising the reliability, quality, comfort and ease of use of the carriageway.

Inspection Requirement	Detailed inspections of carriageways, crossovers, central islands and central reserves, hard shoulders and lay-by.	
Inspection Frequency	MC	Annual Detailed Inspection
	MD	2 Yearly Central Reserve Inspection
	MS	Structural Pavement Condition Survey

Defect Description	Code	Attribute	Units	Min.	Max.
Localised Cracking Cracking confined to a discrete area of the carriageway and not associated with structural maintenance activities.	LOCK	Area:	sq metres	1	250
Localised edge deterioration Cracking confined to a discrete area of the carriageway and not associated with structural maintenance activities.	LODT	Length:	metres	1	100
Surfacing joints Open or excessive joints.	SRJT	Length:	metres	1	100
Cracking around ironwork	CKIR	Area:	sq metres	1	250
Patch – adjacent cracking	PACK	Area:	sq metres	1	250
Patch – loss of material (fretting)	PLMT	Area:	sq metres	1	250
Patch – difference in level Difference in level of a patch with the surrounding carriageway.	PDLV	Area:	sq metres	1	250
Trench RI – adjacent cracking Cracking around a reinstated trench.	TACK	Area:	sq metres	1	250
Trench RI – loss of material Loss of material (fretting) from a reinstated trench.	TLMT	Area:	sq metres	1	250
Trench RI – difference in level Difference in level between a reinstated trench and the surrounding carriageway.	TDLV	Area:	sq metres	1	250
Pothole	POTH	Area:	sq metres	1	250
Single crack	CRCK	Length:	metres	1	250
Patch – material cracking Cracking of the material used for patching.	PMCK	Area:	sq metres	1	250
Trench RI – material cracking Cracking of the material used to reinstate the trench.	TMCK	Area:	sq metres	1	250

Bituminous surfacing fretting Loss of material from the carriageway surface.	BFRT	Area:	sq metres	1	250
Flooding	FLOD	Area	sq metres	1	250
Debris in traffic lane	DBTL	Area	sq metres	1	250
Debris in hard shoulder	DBHS	Area	sq metres	1	250
Detritus	DETR	Area	sq metres	1	250
Other	OTHR				
None	NONE				

Category 1 Defects include but shall not be limited to the following Defects:

POTH	Factors such as traffic speed, type and volume, road alignment and visibility, and the position of the pothole in the road relative to the normal track taken by vehicles shall be considered when categorising the Defect. Pothole \geq 40mm and larger than 100mm x 100mm shall be categorised as Category 1 defects. Smaller or shallower potholes shall also be recorded as Category 1 defects where they pose a risk to road users . Abrupt difference in level between the carriageway and any trench, repair or ironwork.
PDLV, TDLV	Road edge breaking and falling away (note: overrun of verge is not a Category 1 defect).
LODT	Sufficient amount of water lying on, or running along/across the carriageway which represents a hazard to road users, may interrupt the free flow of traffic, or cause damage to other Structures or the carriageway.
FLOD	
DBTL, DBHS	Debris on the hardshoulder or carriageway that could damage a vehicle or cause road users to take avoiding action (note: immediate action should be taken to remove such debris).
DETR	Any severe accumulation of dirt, stone, gravel or other material in the hardshoulder or carriageway (note: immediate action should be taken to deal with oil spillages).



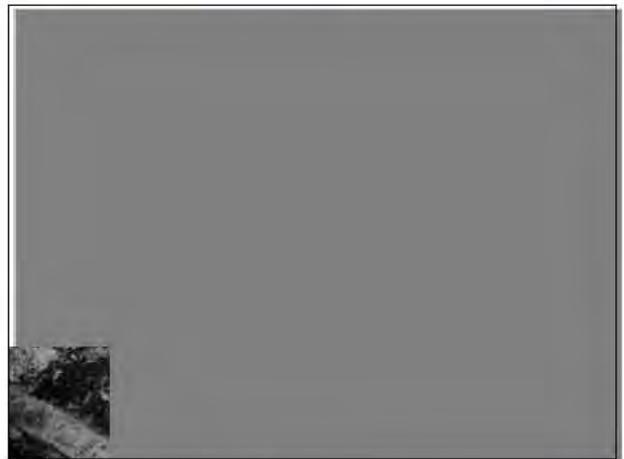
SRJT Surfacing Joints



CKIR Cracking around ironwork



PACK Patch adjacent cracking



PLMT Patch – loss of material



PDLV Patch – difference in level



TACK Trench RI – adjacent cracking



TLMT Trench RI - loss of material



TDLV Trench RI – difference in level



POTH Pothole



DBHS Debris in hard shoulder



FLOD Flooding



Concrete Carriageways

Permitted Inventory Items

- Carriageway (CW)
- Crossovers (XO)
- Central Reserves (CR)
- Central Islands (CI)
- Hard Shoulders (HS)
- Lay-by (LB)

This section relates to minor repairs to concrete carriageways. It does not relate to larger scale work needed to strengthen the carriageway or to work linked with structural maintenance, including surface dressing, which would normally be classed as, or linked to, structural maintenance activities.

Particular consideration should be given to defects, which may constitute an immediate danger to road users and to identify deficiencies compromising the reliability, quality, comfort and ease of use of the carriageway.

Inspection Requirement	Detailed inspections of carriageways, crossovers, central islands and central reserves, hard shoulders and lay-by.	
Inspection Frequency	MC	Annual Detailed Inspection
	MD	2 Yearly Central Reserve Inspection
	MS	Structural Pavement Condition Survey

Defect Description	Code	Attribute	Units	Min.	Max.
Joint seals	JTSL	Length:	metres	1	100
Shallow spalling at joints / cracks	SSPL	Length:	metres	1	100
Deep spalling at joints	DSPL	Length:	metres	1	100
Opening of longitudinal joint	OLJT	Length:	metres	1	100
Stepping at joint / crack	STEP	Length:	metres	1	100
Vertical movement under traffic	VMVT	Area:	sq metres	1	250
Evidence of pumping	EPMP	Area:	sq metres	1	250
Settlement / ponding	SETT	Area:	sq metres	1	250
Cracking	CRCK	Length:	metres	1	100
Failed overbanding / sealed cracks	OVSD	Length:	metres	1	100
Surface crazing	SRCZ	Area:	sq metres	1	250
Scaling	SCAL	Area:	sq metres	1	250
Miscellaneous surface Defects	MSRF	Area:	sq metres	1	250
Surface texture worn	SRTX	Area:	sq metres	1	250
Initiate skid test	SKID	Length:	metres	1	100
Failed repair	RFAL	Area:	sq metres	1	250
Patch – difference in level Difference in level of a patch with the surrounding carriageway.	PDLV	Area:	sq metres	1	250
Trench RI – difference in level Difference in level between a reinstated trench and the surrounding carriageway.	TDLV	Area:	sq metres	1	250
Localised edge deterioration Cracking confined to a discrete area of the carriageway and not associated with structural maintenance activities.	LODT	Length:	metres	1	100
Debris in traffic lane	DBTL	Area	sq metres	1	250

Debris in hard shoulder	DBHS	Area	sq metres	1	250
Detritus	DETR	Area	sq metres	1	250
Flooding	FLOD	Area:	sq metres	1	250
Other	OTHR				
None	NONE				

Category 1 Defects include but shall not be limited to the following Defects:

SSPL, DSPL	Factors such as traffic speed, type and volume, road alignment and visibility, and the position of the spalling in the road must also be considered when categorising the Defect. Spalling in concrete $\geq 40\text{mm}$ deep and $> 100\text{mm} \times 100\text{mm}$ shall be categorised as Category 1 defects. Smaller/shallower spalling shall also be recorded as Category 1 defects where they pose a risk to road users.
PDLV, TDLV	Abrupt difference in level between the carriageway and any trench, repair or ironwork.
LODT	Road edge breaking and falling (note: overrun of verge is not a Category 1 defect).
STEP	Difference in level between adjacent concrete bays, either longitudinal or transverse.
FLOD	Sufficient amount of water lying on, or running along/across the carriageway which represents a hazard to road users, may interrupt the free flow of traffic, or cause damage to other Structures or the carriageway.
DBTL, DBHS	Debris on the hardshoulder or carriageway that could damage a vehicle or cause road users to take avoiding action (note: immediate action should be taken to remove such debris).
DETR	Any severe accumulation of dirt, stone, gravel or other material in the hardshoulder or carriageway (note: immediate action should be taken to deal with oil spillages).



JTSL Joints seals



SSPL Shallow spalling at joints/cracks



DSPL Deep spalling at joints



OLJT Opening of longitudinal joint



STEP Stepping at joint



CRCK Cracking



OVSD Failed overbanding / sealed cracks



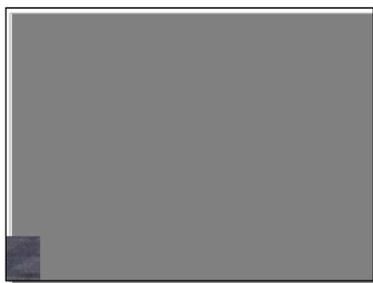
SRTX Surface Texture Worn



RFAL Failed Repair



OTHR



Pedestrian and Cycle Facilities

Permitted Inventory Items

- Footway (FW)
- Cycle Facility (CT)
- Bus stop(BS)
- Miscellaneous street furniture

Footways include the walking surfaces of subways, structures and pedestrian rights of way which are under the responsibility of Transport Scotland and which may occasionally fall outside the road boundary. A cycle track is a paved facility available for persons with pedal cycles, with or without a right of way on foot, usually within the road boundary.

This section relates to minor repairs to footways and cycle tracks. It does not relate to larger scale work which would normally be classed as, or linked to, structural maintenance activities. Particular consideration should be given to defects, such as trips, which may constitute an immediate danger to pedestrians and/or cyclists.

Inspection Requirement	Detailed inspections of pedestrian and cycle facilities	
Inspection Frequency	FCA	Monthly Detailed Inspection (Category A)
	FCB	3 monthly Detailed Inspection (Category B)
	FC	All other areas Annual Detailed Inspection

Defect Description	Code	Attribute	Units	Min.	Max.
Standing water	STWT	Length:	metres	1	100
Slab profile – uneven/trips	SLPF	Area:	sq metres	1	250
Slab cracking	SLCK	Area:	sq metres	1	250
Slab rocking	SROK	Area:	sq metres	1	250
Block profile	BKPF	Area:	sq metres	1	250
Bituminous surfacing – potholes	BPOT	Area::	sq metres	1	250
Bituminous surfacing – local cracking Cracking confined to a discrete area of the footway / cycle track.	BLCK	Area:	sq metres	1	250
Bituminous surfacing – extensive cracking Cracking affecting the major part of a footway / cycle facility.	BECK	Area:	sq metres	1	250
Bituminous surfacing – fretting Loss of material from the footway / cycle facility surface.	BFRT	Area:	sq metres	1	250
Failed patch – adjacent cracking	FPCK	Area:	sq metres	1	250
Failed patch – loss of material Loss of material (fretting) from an existing area of patching.	FLMT	Area:	sq metres	1	250
Failed patch – difference in level	FDLV	Area:	sq metres	1	250
Overgrown by vegetation	OVGV	Length:	metres	1	100
Trench RI – adjacent cracking Cracking around a reinstated trench.	RACK	Area:	sq metres	1	250
Trench RI – loss of material Loss of material (fretting) from a reinstated trench.	RLMT	Area:	sq metres	1	250
Trench RI – difference in level	RDLV	Area:	sq metres	1	200
Other	OTHR				
None	NONE				

DDA defects associated with Footway(FW) & Cycle Facility(CT) Inventory

Footway and Cycleway DDA Defect Description	Code
Kerb upstand adjacent to c/way < 80mm high (excl crossing points)	DD001
Lack of edge definition (upstand) at rear	DD002
Lack of dropped kerb	DD003
Kerb upstand at crossing > 6mm high	DD004
Width of dropped kerb at uncontrolled crossing is < 1200mm	DD005
Width of dropped kerb at controlled crossing is < 2400mm	DD006
Crossfall of transition area between footway level and dropped kerb level in excess of 1:12 (8.3%)	DD007
Gradient in excess of 1:11 (9%) on dropper kerb	DD008
Bus boarding kerb outwith 125 - 160mm range	DD009
Bus raised boarding area gradient in excess of 1:12 (8.3%)	DD010
Bus raised boarding area is <3000mm long	DD011
Step going length outwith 250-425mm range (depth of tread in the horizontal plane)	DD023
Flight has in excess of 12 steps	DD024
Flight has less than 3 steps	DD025
Rise for a single step outwith 150-170mm range	DD026
Lack of tonal contrast between step nosing and tread, and step nosing and riser	DD027
Step nosing is not non-slip	DD028
Nosing projects in excess of 25mm in horizontal plane	DD029
Risers are open	DD030
Nosings and not parallel with the other nosings	DD031
Nosings and not parallel with the ground/landing	DD032
Taping rails not provided in line with staircase treads	DD033
Stairs are not accompanied by a ramp	DD034
Lack of landings between successive flights	DD035
Longitudinal gradient in excess of 1:20 (5%)	DD036
Crossfall in excess of 1:40 (2.5%)	DD037
Abrupt change in gradient (should be rounded)	DD038
Identify areas (in excess of 10m ²) where surface irregularity exceeds 3mm in a vertical plane	DD039
Identify any gaps exceeding 10mm in a horizontal plane	DD040
Grating placed in area of main pedestrian flow	DD041
Obstacle free width is < 1300mm	DD042
Unobstructed height above footway is < 2300mm, incl overhanging vegetation	DD043
Inconsistent position of a succession of obstacles necessitates weaving	DD044
Width at footway is restricted locally to < 1000mm	DD045
Pole at front of footway outwith 500-600mm offset from c/way	DD046
Edge of footway has sudden level change	DD047
Lack of edge definition	DD048
Seating not provided every 50m	DD049
Seating width is < 500mm	DD050
Seating height is not 470-480mm off ground level	DD051
Seating does not have back rest	DD052
Seating does not have arm rests	DD053
Seating lacks adequate tonal contrast	DD054

Footway and Cycleway DDA Defect Description	Code
Bus stop can not be reached by adjoining footways	DD055
Footway at bus stop is < 3000mm wide	DD056
Width of clear space at bus shelter is < 1000mm	DD057
Ramp not accompanied by steps where the level difference exceeds 200mm	DD058
Ramp is a stepped ramp	DD059
Ramp and landings do not contrast tonally	DD060
Ramp longitudinal gradient in excess of 1:10 (10%) for ramp flight up to 600mm going	DD061
Ramp longitudinal gradient in excess of 1:12 (8.3%) for ramp flight up to 2m going	DD062
Ramp longitudinal gradient in excess of 1:15 (6.7%) for ramp flight up to 5m going	DD063
Ramp longitudinal gradient in excess of 1:20 (5%) for ramp flight up to 10m going	DD064
Individual ramp flight in excess of 10m long	DD065
Individual ramp rise in excess of 500mm	DD066
Sides of ramp not protected by a raised kerb of 100mm min height	DD067
Ramp crossfall in excess of 1:40 (2.5%)	DD068
Total rise in ramped section in excess of 2m	DD069
Total length of ramped section in excess of 50m, but less than 132m	DD070
Length of landing to top/bottom of flight is < 1200mm	DD071
Length of intermediate landing is < 1500mm	DD072
Length of landing at change in direction is < 1800mm	DD073
A landing has not been applied at change in direction	DD074
Landing longitudinal gradient in excess of 1:40 (2.5%)	DD075
Lack of adequate tonal contrast	DD076
Redundant street furniture	DD077
Free standing object does not meet min. height criteria of 1000mm	DD078
Gate latch inoperable by person with reach difficulties eg wheelchair user	DD079
Staggered barriers/access control less than 1200mm apart	DD080
Lack of tactile paving	DD081
Inappropriate tactile paving type	DD082
Inappropriate tactile paving colour	DD083
Inappropriate tactile paving layout	DD084
Outdated/worn profile on tactile paving	DD085
Tactile paving does not contrast tonally with surrounding paving	DD086
The back edge of the tactile surface is not at right angles to the direction of crossing/travel	DD087
Pedestrian route around a junction is not continuous	DD088
Width between handrails is < 1000mm	DD089
Width between handrails is < 1800mm (this does not allow two way movement)	DD090
Width between handrails is > 1800mm	DD091
Handrails not provided on both sides of flight	DD092
Handrails on flight not provided at height of 900-1000mm	DD093
Handrails not continuous across intermediate landings	DD094
Handrails do not extend 300mm past top and bottom of flight	DD095
End of handrail projects into route of travel	DD096
End of handrail does not return into wall/ground or have 100mm downturn (to prevent injury to users)	DD097
Handrail of material which is cold to the touch	DD098
Handrails are not tonally contrasted with background	DD099

Footway and Cycleway DDA Defect Description	Code
Circular handrails does not have cross section of 40-50mm diameter	DD100
Oval handrail does not have cross section of 50 x 35mm	DD101
Clear space between handrail and adjacent wall is < 60mm	DD102
Parking bay does not meet 4800 x 2400mm size	DD103
Accessible parking bay (parallel/kerb side) does not meet 6600 x 3600mm size	DD104
No dedicated accessible parking bay provided	DD105
Lack of 1.2m hatched aisles at dedicated accessible parking bay	DD106
Lack of signage at dedicated accessible parking bay	DD107
Clearance between parked vehicle and running lane is < 1200mm	DD108
Lack of footway facilities for parked vehicle	DD109
Footway is < 1500mm wide	DD110
Crossfall beside parked vehicle in excess of 1:20 (5%)	DD111
Crossing point not on obvious pedestrian desire line	DD112
Crossing point at junction bellmouth not at ideal location	DD113
Lack of refuge at crossing	DD114
Refuge at crossing is < 1500mm wide	DD115
Pedestrian crossing is zebra type	DD116

DDA defects associated with Bus Stop – BS Inventory

Bus stop DDA Defect Description	Code
Bus boarding kerb outwith 125 - 160mm range	DD009
Bus raised boarding area gradient in excess of 1:12 (8.3%)	DD010
Bus raised boarding area is <3000mm long	DD011
Flag on bus stop pole is < 300 x 250mm	DD013
Route numbers on bus stop flag pole are < 50mm high	DD014
Lack of bus shelter	DD015
Bus shelter lacks seating	DD016
Passengers in bus shelter cannot see or be seen by oncoming vehicle	DD017
Bus shelter lacks adequate tonal contrast	DD018
Bus timetable positioned outwith 900-1800mm range off ground level	DD019
Bus timetable font size illegible (character height should be 15-25mm)	DD020
Lack of bus stop flag pole	DD021
Lack of bus stop timetable	DD022
Grating placed in area of main pedestrian flow	DD041
Pole at front of footway outwith 500-600mm offset from c/way	DD046
Seating width is < 500mm	DD050
Seating height is not 470-480mm off ground level	DD051
Seating does not have back rest	DD052
Seating does not have arm rests	DD053
Seating lacks adequate tonal contrast	DD054
Bus stop can not be reached by adjoining footways	DD055
Footway at bus stop is < 3000mm wide	DD056
Width of clear space at bus shelter is < 1000mm	DD057
Lack of adequate tonal contrast	DD076
Redundant street furniture	DD077
Free standing object does not meet min. height criteria of 1000mm	DD078
Parking bay does not meet 4800 x 2400mm size	DD103
Accessible parking bay (parallel/kerb side) does not meet 6600 x 3600mm size	DD104
No dedicated accessible parking bay provided	DD105
Lack of 1.2m hatched aisles at dedicated accessible parking bay	DD106
Lack of signage at dedicated accessible parking bay	DD107
Clearance between parked vehicle and running lane is < 1200mm	DD108
Lack of footway facilities for parked vehicle	DD109
Crossfall beside parked vehicle in excess of 1:20 (5%)	DD111

DDA defects associated with Miscellaneous street furniture – MF Inventory

DDA Defect Description	Code
Seating not provided every 50m	DD049
Seating width is < 500mm	DD050
Seating height is not 470-480mm off ground level	DD051
Seating does not have back rest	DD052
Seating does not have arm rests	DD053
Seating lacks adequate tonal contrast	DD054
Lack of adequate tonal contrast	DD076
Redundant street furniture	DD077
Free standing object does not meet min. height criteria of 1000mm	DD078

Category 1 Defects include but shall not be limited to the following Defects:

BPOT	Pothole \geq 25mm deep, regardless of size. For shallower potholes, factors such as pedestrian/cycle flows, and the position of the pothole in the footway/cycle track relative to the normal track taken by pedestrians/cyclists must also be considered when categorising the Defect.
FDLV, RDLV	Abrupt difference in level between the footway and any trench, repair or ironwork.
SROK, SLPF	Rocking, uneven or missing/broken slabs resulting in a trip hazard.
STWT	Standing water which obstructs the footway to such an extent that pedestrians are likely to step off the footway to pass.



SLPF Slab profile – uneven/trips



SLCK Slab Cracking



BKPF Block Profile



BPOT Bituminous surfacing – potholes



BLCK Bituminous Surfacing – Extensive Cracking



BECK Bituminous Surfacing – Extensive Cracking



FPCK Failed Patch – adjacent cracking



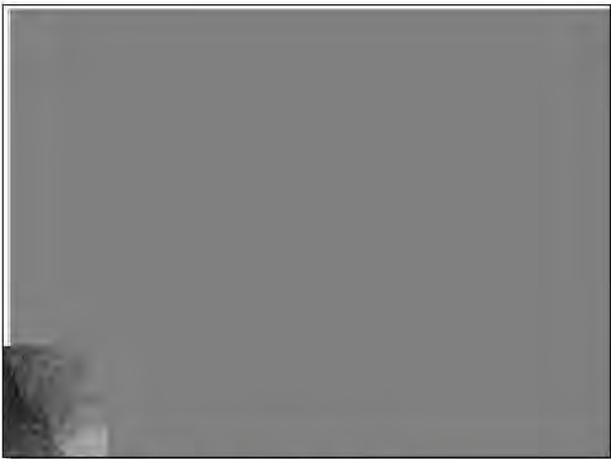
FLMT Failed Patch – loss of material



FDLV Failed Patch – difference in level



OVGV Overgrown by vegetation



RLMT Trench RI – loss of material



RDLV Trench RI – difference in level



Covers, Gratings and Frames

Permitted Inventory Items

- Catchpit (CP)
- Gully (GY)
- Separators (IN)
- Cable Chambers (CC)
- Manhole (MH)
- Piped Grip (PG)
- Soakaways(SO)

This section relates to the repairs and occasional replacement of all types of gratings, covers, frames and boxes within the trunk road network, including those that fall under the responsibility of Undertakers and other parties. The majority of covers are situated in carriageways and footways but those in verges, particularly those verges that are likely to be traversed by pedestrians should not be ignored.

Where an inspection by the Operating Company identifies a cover, grating or frame with a Category 1 Defect, it shall be made safe by the Operating Company in accordance with the Contract. Where the cover, grating or frame is the property of an Undertaker or third party, the Operating Company shall immediately give notice to the Undertaker or third party to carry out permanent repairs.

It may be difficult to decide whether a cracked or broken item is in danger of collapse. If in doubt, it should be replaced, irrespective of its position. Defects in covers and gratings may pose particular danger to pedal and motor cycle users. Rocking gratings or covers with only a small movement under load may nevertheless be a nuisance in urban areas because of the intrusive noise. If complaints are received they should be corrected.

Inspection Requirement	Detailed inspections of covers, gratings and frames	
Inspection Frequency	CG	Annual Detailed Inspection
	CD	2 Yearly Central Reserve Inspection

Defect Description	Code	Attribute	Units	Min.	Max.
Difference in level with road Differential levels between items and abutting carriageway, footway or cycle track surface.	IDLV	Number:		1	50
Difference in component levels Differential levels between different components.	ICLV	Number:		1	50
Rocking under load	IRLD	Number:		1	50
Cracked or broken	IBCK	Number:		1	50
Missing Attention shall be paid to missing items that are likely to constitute a hazard.	MISS	Number:		1	50
Parallel gratings Gullies and other gratings in carriageways and cycle tracks which have gaps more than 20mm wide parallel to the normal line of movement of pedal and motor cycles shall be classed as Defects.	PARL	Number:		1	50
Smooth surface Worn covers which may cause pedal and motor cycle users to skid in wet conditions shall generally be considered to constitute an immediate hazard.	SMTH	Number:		1	50
Blockage Applies to surface water catchment items.	BLOK	Number:		1	50
Flooding	FLOD	Area	sq metres	1	250
Seized	SIEZ	Number:		1	50

Defect Description	Code	Attribute	Units	Min.	Max.
Flood Nuisance to properties	NRNP				
Flood Nuisance to services	NSER				
Other	OTHR				
None	NONE				

Category 1 Defects include but shall not be limited to the following Defects:

IBCK	Broken or damaged covers in the carriageway or footway.
IDLV, ICLV	Abrupt difference in level in carriageways, footways or cycle tracks.
IRLD	Rocking grating or covers in urban areas causing intrusive noise.
MISS	Missing items that are likely to constitute a hazard to road users, pedestrians or cyclists.
SMTH	Smooth surface (visual assessment) on manhole covers in footways or carriageway, especially those areas where skidding resistance is important (i.e. approach to junctions, traffic signals or tight radii).
PARL	Incorrectly fitted gratings where the water bars are parallel to the direction of traffic flow.
BLOK, FLOD	Water lying on, or running along/across the carriageway as a result of any significant loss of capacity in any part of the drainage system.
NPRP, NSER	Indications that flooding of any private property is imminent.

DDA defects associated with Catchpit – CP, Gully – GY, Manhole – MH, Separator – SP, Soakaway – SO Inventory items.

DDA Defect Description	Code
Grating placed in area of main pedestrian flow	DD041



IDLV Difference in level with road



ICLV Difference in component levels



IBCK Cracked or Broken



MISS Missing



SMTH Smooth Surface



BLOK Blockage



Kerbs, Channels, Edgings and Quadrants

Permitted Inventory Items

- Kerb (KB)
- Channel (CH)

This section relates to the minor repairs to all types of kerbs, edgings and pre-formed channels. Although these items tend to be stable by their nature and construction specification, hazardous conditions can develop quickly when either individual kerbs, or short lengths, are damaged or put out of alignment by heavy vehicles, or when local subsidence occurs. Frequent damage by heavy vehicles may suggest the need for local realignment or a more robust specification. Short, sometimes isolated, lengths of kerb serving gullies or grips should not be overlooked.

Inspection Requirement	Detailed inspections of kerbs, channels, edgings and quadrants	
Inspection Frequency	KC	Annual Detailed Inspection
	KD	2 Yearly Central Reserve Inspection

Defect Description	Code	Attribute	Units	Min.	Max.
Vertical projection	EVPJ	Length:	metres	1	100
Horizontal projection	EHPJ	Length:	metres	1	100
Loose/ rocking Loose or rocking items which shall be creating or shall be likely to create hazard.	ELRK	Length:	metres	1	100
Damaged Damaged or shattered items shall be creating or shall be likely to create a hazard.	DAMG	Length:	metres	1	100
Channel block alignment Poor local alignment of pre-formed channels which could give rise to danger or nuisance from standing water or damage to the trunk road caused by water penetration.	CHAL	Length:	metres	1	100
Missing	MISS	Length:	metres	1	100
Flooding	FLOD				
Impeded water flow (detritus) Detritus at the edge of the carriageway preventing over-edge run-off and/ or flow long the channel which could give rise to danger or nuisance from standing water or damage to the trunk road structure by water penetration.	IMWF	Length:	metres	1	100
Weed growth Vegetation growth at the edge of the carriageway preventing over-edge run-off and/ or flow along the channel which could give rise to danger or nuisance from standing water or damage to the trunk road structure by water penetration.	WEED	Length:	metres	1	100
Flood Nuisance to properties	NRNP				
Flood Nuisance to services	NSER				
Other	OTHR				
None	NONE				

DDA defects associated with Kerb – KB, Channel - CH Inventory items.

DDA Defect Description	Code
Kerb upstand adjacent to c/way < 80mm high (excl crossing points)	DD001
Lack of edge definition (upstand) at rear	DD002
Lack of dropped kerb	DD003
Kerb upstand at crossing > 6mm high	DD004
Width of dropped kerb at uncontrolled crossing is < 1200mm	DD005
Width of dropped kerb at controlled crossing is < 2400mm	DD006
Crossfall of transition area between footway level and dropped kerb level in excess of 1:12 (8.3%)	DD007
Gradient in excess of 1:11 (9%) on dropper kerb	DD008
Bus boarding kerb outwith 125 - 160mm range	DD009
Bus raised boarding area gradient in excess of 1:12 (8.3%)	DD010
Bus raised boarding area is <3000mm long	DD011
Kerb upstand adjacent to c/way < 25mm high (at vehicle crossing points eg driveway)	DD012
Grating placed in area of main pedestrian flow	DD041

Category 1 Defects include but shall not be limited to the following Defects:

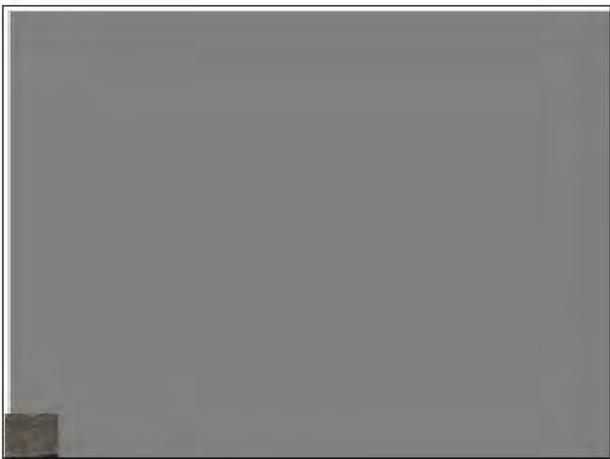
EVPJ, EHPJ	Dislodged or misaligned kerbs or channels that project into carriageway or hardshoulder or will impede water flow.
ELRK, DAMG, CHAL	Loose, rocking or damaged kerbs or channels that are likely to constitute a hazard to road users, pedestrians or cyclists.
MISS	Any missing kerbs adjacent to carriageway, i.e. no hardshoulder.
NPRP, NSER	Indications that flooding of any private property is imminent.
FLOD, CHAL, IMWF, WEED, EVPJ, EHPJ,	Water lying on, or running along/across the carriageway as a result of any significant loss of capacity in any part of the drainage system.



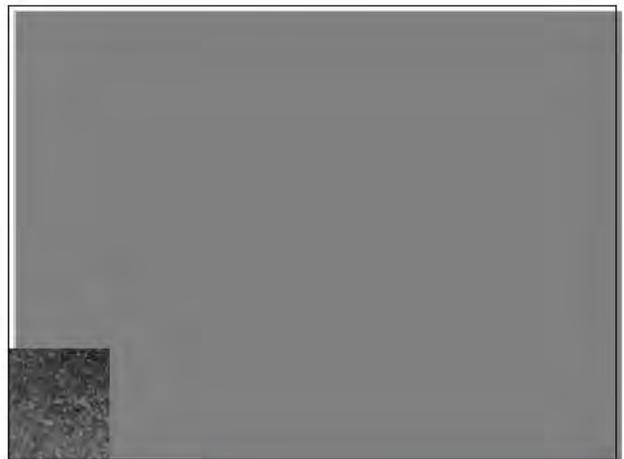
WEED Weed Growth



EHPJ Horizontal projection



ELRK Loose/ Rocking



DAMG Damaged



MISS Missing



IMWF Impeded water flow

Linear Drainage Systems



Permitted Inventory Items

- Counterfort Drain (CD)
- Catchpit (CP)
- Filter Drain (FD)
- Manhole (MH)
- Soakaway(SO)
- Piped Drainage (PD)
- Interceptor (IN)
- Gully (GY)
- Piped Grip (PG)

This section relates to minor repairs and treatment of defects within all types of linear drainage systems. Large culverts are not included. If properly designed and constructed, linear drainage systems should be self-cleansing and maintenance should only become necessary when a blockage or other fault occurs. Those parts of a system that habitually give trouble should be known and inspected more frequently. Before any work is carried out, ownership of the drainage system should be determined but flooding resulting in a Category 1 Defect should always be mitigated regardless of ownership.

Symptoms of blockage or faults that should normally prompt further investigation include backing up and flooding at the entry points to the drainage system; dry outfalls; wet areas on verges; and the presence of lush vegetation.

Inspection Requirement	Detailed inspections of piped drains, combined drainage and kerb systems, feeder pipes, linear drainage channel systems, kerb or channel offlet pipes, channels through chambers and piped grips.	
Inspection Frequency	PD	Annual Detailed Inspection
	PI	Special Investigation prompted by evidence of a specific problem
	VC	Specialist Video Inspection

Defect Description	Code	Attribute	Units	Min.	Max.
Blockage	BLOK	Length:	metres	1	100
Other malfunction	OMAL	Length:	metres	1	100
Flooding	FLOD	Area:	sq metres	1	250
Drainage damage to road / verge	DRRD	Length:	metres	1	100
Silted	SILT	Length:	metres	1	100
Roots present	ROOT	Length:	metres	1	100
Cracking	CRCK	Length:	metres	1	100
Deformation	DEFM	Length:	metres	1	100
Collapsed	COLP	Length:	metres	1	100
Alignment irregular	LINE	Length:	Metres	1	100
Standing water	STWT	Area:	sq metres	1	250
Scour	SCOR	Length:	Metres	1	100
Pollution	POLN	Length:	Metres	1	100
Flood Nuisance to properties	NRNP				
Flood Nuisance to services	NSER				
Other	OTHR				

None

NONE

Category 1 Defects include but shall not be limited to the following Defects:

FLOD, STWT, BLOK, OMAL, SILT, COLP	Water lying on, or running along/across the carriageway as a result of any significant loss of capacity in any part of the drainage system.
NPRP, NSER	Indications that flooding of any private property is imminent.
POLN	Visual evidence of pollution.
COLP	Any collapsed linear drainage system that threatens to obstruct any part of the carriageway or footway or endanger lighting or communications equipment.



BLOK Blockage



OMAL Other malfunction



FLOD Flooding



STWT/FLOD Standing water/ Flooding



SILT Silted



COLP Collapsed



Gullies, Catchpits, Soakaways, Manholes, Interceptors and Separators

Permitted Inventory Items

- Catchpit (CP)
- Gully (GY)
- Soakaways (SO)
- Separators (IN)
- Manhole (MH)

This section relates to the inspection of gullies, catchpits, interceptors, soakaways, manholes and oil separators. These are often located at known sensitive drainage points and therefore require close attention by the Operating Company

Inspection Requirement	Detailed inspections of gullies, catch pits, interceptors, soakaways, manholes and oil separators	
Inspection Frequency	GC	Annual Detailed Inspection
	GD	2 Yearly Central Reserve Inspection

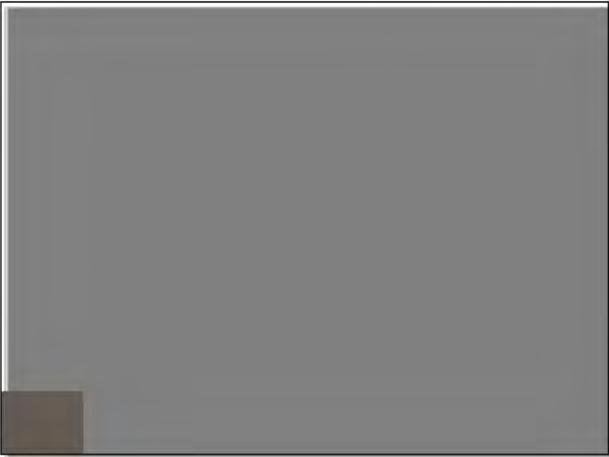
Defect Description	Code	Attribute	Units	Min.	Max.
Damaged	DAMG	Number:		1	50
Collapsed	COLP	Number:		1	50
Silted	SILT	Number:		1	50
Blockage	BLOK	Number:		1	50
Shaft defective	SHFT	Number:		1	50
Chamber / benching / pot defective	CHAM	Number:		1	50
Invert / sump defective	INVT	Number:		1	50
Ancillaries defective	ANCS	Number:		1	50
Detritus / Refuse Presence of detritus likely to impede the function of the piped grip.	DETR	Number:		1	50
Broken	BROK	Number:		1	50
Flooding	FLOD	Area:	sq metres	1	250
Flood Nuisance to properties	NRNP				
Flood Nuisance to services	NSER				
Other	OTHR				
None	NONE				

DDA defects associated with Catchpit – CP, Gully – GY, Manhole – MH, Separator – SP, Soakaway – SO Inventory items.

DDA Defect Description	Code
Grating placed in area of main pedestrian flow	DD041

Category 1 Defects include but shall not be limited to the following Defects:

BROK, DAMG, COLP	Broken, damaged or collapsed items that are likely to constitute a hazard to road users, pedestrians or cyclists.
NPRP, NSER	Indications that flooding of any private property is imminent.
FLOD, DAMG, COLP, SILT, BLOK, DETR, SHFT, CHAM, INVT, ANCS	Water lying on, or running along/across the carriageway as a result of any significant loss of capacity in any part of the drainage system.



BLOK Blockage



BROK Broken



COLP Collapsed



DAMG Damaged



SILT Silted



Drainage Grips

Permitted Inventory Items

- Grips (GP)

This section relates to grips which are defined as open channels cut across rural verges and leading to ditches or filter drains, ending at an appropriate distance from the carriageway or hard shoulder.

Drainage grips are often located at known sensitive drainage points and therefore require close attention by the Operating Company.

Inspection Requirement	Detailed inspections of drainage grips	
Inspection Frequency	GP	Annual Detailed Inspection
	GP2	2 Yearly Central Reserve Inspection

Defect Description	Code	Attribute	Units	Min.	Max.
Weed growth	WEED	Length:	metres	1	100
Detritus / refuse Presence of detritus or refuse within a drainage grip.	DETR	Length:	metres	1	100
Blockage	BLOK	Length:	metres	1	100
Flooding	FLOD	Area:	sq metres	1	250
Other	OTHR				
Flood Nuisance to properties	NRNP				
Flood Nuisance to services	NSER				
None	NONE				

Category 1 Defects include but shall not be limited to the following Defects:

FLOD, WEED, DETR, BLOK	Water lying on, or running along/across the carriageway as a result of any significant loss of capacity in any part of the drainage system.
NPRP, NSER	Indications that flooding of any private property is imminent.



WEED Weed Growth



BLOK Blockage



Ditches

Permitted Inventory Items

- Ditches (DI)

This section relates to ditches which are defined as a channel adjacent to the road for drainage. Ditches can become overgrown with vegetation; silted up; blocked with debris, rubbish or bank erosion, to the extent that the flow is impeded. Water in a ditch is not itself harmful unless stagnation occurs (resulting in a health hazard), flooding is caused, or a resulting higher water table adversely affects the road or other structural foundations. Inspectors should also be aware of any potential nature conservation interest of ditches, particularly close to natural watercourses, wetland areas etc.

Detailed inspections should, where possible, be co-ordinated with clearing operations.

Inspection Requirement	Detailed inspections of ditches
Inspection Frequency	DI Annual Detailed Inspection

Defect Description	Code	Attribute	Units	Min.	Max.
Weed growth	WEED	Length:	metres	1	100
Collapsed bank	CLBK	Length:	metres	1	100
Obstruction	OBST	Length:	metres	1	100
Deposited rubbish	DRUB	Length:	metres	1	100
Silted	SILT	Length:	metres	1	100
Flooding	FLOD	Area:	sq metres	1	250
Pollution	POLN	Length:	metres	1	100
Flood Nuisance to properties	NRNP				
Flood Nuisance to services	NSER				
Other	OTHR				
None	NONE				

Category 1 Defects include but shall not be limited to the following Defects:

FLOD, WEED, CLBK, OBST, DRUB, SILT	Water lying on, or running along/across the carriageway as a result of any significant loss of capacity in any part of the drainage system.
NPRP, NSER	Indications that flooding of any private property is imminent.
POLN	Visual evidence of pollution.
CLBK	Any collapsed bank that threatens to obstruct any part of the carriageway or footway or endanger lighting or communications equipment.



WEED Weed Growth



OBST Obstruction



DRUB Deposited rubbish



SILT Silting



FLOD Flooding



Filter Material

Permitted Inventory Items

- Counterfort Drain (CD)
- Filter Drain (FD)

Filter material refers to filter material associated with filter drains, counterfort drains, drains and soakaways which may incorporate a properly formed invert or collection pipe. These requirements do not apply to pipes associated with filter drains or chambers associated with soakaways.

The efficiency of filter drains can be seriously impaired by the formation of a silt crust, with attendant vegetation growth, at the top of the filter material, or by the accumulation of trapped silt in the lower layers.

Inspection Requirement	Detailed inspections of Filter Materials	
Inspection Frequency	FD	Filter Drains and Soakaways – Annual Detailed Inspection
	FG	2 Yearly Central Reserve Inspection

Defect Description	Code	Attribute	Units	Min.	Max.
Weed growth	WEED	Length:	metres	1	100
Filter drain damaged	FMDM	Length:	metres	1	100
Filter material displaced	FMDS	Length:	metres	1	100
Silted	SILT	Length:	metres	1	100
Flooding	FLOD	Area:	sq metres	1	250
Flood Nuisance to properties	NRNP				
Flood Nuisance to services	NSER				
Other	OTHR				
None	NONE				

Category 1 Defects include but shall not be limited to the following Defects:

FMDS	Filter material displaced onto the carriageway or hardshoulder that could damage a vehicle or cause road users to take avoiding action. Filter material has been displaced and resulted in abrupt difference of level from the carriageway or hardshoulder to the filter drain.
FLOD, WEED, FMDM, FMDS, SILT	Water lying on, or running along/across the carriageway as a result of any significant loss of capacity in any part of the drainage system.
NPRP, NSER	Indications that flooding of any private property is imminent.